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EXAMINER

DANIELS, MATTHEW J

ART UNIT

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Response to Arguments

1. Applicant's arguments filed 17 March 2009 have been fully considered but they are not persuasive. The arguments appear to be on the following grounds:

a) (page 4) A person of ordinary skill who contemplated the disclosure of Zimmermann and Biglione together would have appreciated that the procedure which is described in the secondary reference yields expandable polystyrene beads. Biglione specifically recognized the suspension polymerization procedure and stated that the expandable granules described as resulting from the Biglione process were similar to those obtained by the suspension polymerization procedure. A person of ordinary skill in the art would have had no reason whatsoever to employ the already expandable polystyrene beads of Zimmermann in the Biglione process.

b) Cuff describes an apparatus for pelletizing with an adaptor and a die, but clearly pertains to the pelletizing of thermoplastics which do not comprise any blowing agent. The same holds true for the Guill reference. A person skilled in the art readily distinguishes between a blowing-agent-containing polymer melt (Biglione) and a blowing agent-free polymer melt (Cuff). It is well known and readily apparent that the conditions which are employed when blowing agent-free polymer melts are pelletized is limited by the decomposition temperature of the resin. In blowing agent-containing polymer melt, it is of major concern that the extruded polymer granules remain expandable and do not expand prematurely. Biglione suggests that such premature expansion is undesirable at col. 2, ll. 20-24.

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c) The polymer in Biglione already bears the distinct risk of undesirable, premature expansion. A person skilled in the art would not reasonably be motivated to further increase the risk of undesirable premature expansion in the granules by heating to an even higher temperature.

d) While Cuff and/or Guill may support that heating a die plate is conventional in the art of pelletizing blowing agent-free thermoplastic material, the references are unsuited to suggest or imply that the technique can be employed successfully in the context of extrusion of a blowing agent-containing polymer melt. In light of the risks of premature and undesirable expansion, a person skilled in the art would have been discouraged from heating the die plate.

e) Applicant observed a decrease in the size of the resulting granules when the die plate temperature was increased from 200 C (the temperature of the polymer melt) to 240 C.

2. The arguments appear to be on the following grounds:

a) It is respectfully submitted that the rejection does not take the position that the beads of Zimmermann are used in the Biglione process. Instead, Biglione is silent to any particular molecular weight. In selecting an appropriate molecular weight to produce the foamable granules of Biglione, one practicing the Biglione process would have naturally and obviously been guided to polystyrene molecular weights with demonstrated foaming capability when combined with a blowing agent. Zimmermann is one example. The suspension polymerization and other aspects of the Zimmermann process are peripheral to this issue, and bodily incorporation of Zimmermann was not asserted or stated. Instead, selection of an appropriate molecular weight for use in the Biglione process would have been obvious since the claimed molecular weights are already known from Zimmermann for a similar foamable material.

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b) The arguments against Cuff have been interpreted with respect to Claim 8 since the proposed claim amendments are not being entered.

The portion of the Biglione reference cited by Applicants does not appear to support the proposition for which it is cited. The passage at col. 2, ll. 20-25 of Biglione describes working at a high temperature and then cooling slowly in order to eliminate orientations and stresses caused by quenching. See col. 2, ll. 3-8. The passage does not appear to address the particular polymer temperature and die temperatures used. What Biglione does expressly suggest is that solidification and obstruction of the polymer in the extrusion holes should be avoided, and that this may require an elevated temperature. See col. 3, ll. 30-35. Cuff teaches that heating of the die maintains the manifolds and channels at an elevated temperature, keeping the plastic entering these bores in a heated condition. Doing so has the obvious effect of counteracting the cooling effect of the cooling water used to solidify the pellets. Since avoidance of solidification and obstruction in the extrusion holes is expressly suggested by Biglione, and the Cuff process would avoid solidification and obstruction in the extrusion holes through the use of a heated die face, it is submitted that the combination set forth in the rejection of Claim 8 is valid. It is submitted that one skilled in the art would have recognized that this technique (heated die face) is applicable to plastics with or without blowing agents since solidification and obstruction in the die face is no more desirable in plastics containing blowing agents than in those without blowing agents. In both the processes of Biglione and Cuff, an underwater pelletizer is used, which are conventional devices which flow water over the die face while the polymer is extruded and cut. It is this cooling water which avoids pre-expansion of the granules, despite the variation in temperatures which may be used in the extrusion process of Biglione.

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c) Any alleged distinct risk of undesirable, premature expansion is mitigated by Biglione's use of cooling water flowing over the die face in the underwater pelletizer. The ordinary artisan recognizes that this cooling medium counteracts increases in the temperature of the extruded polymer and the die face.

d) It is the Examiner's position that one skilled in the art would have recognized obstruction of the die and solidification of polymer in the extrusion die as a problem for polymers without regard to whether they included blowing agents or not. In either case, the solution would have been obvious over Cuff: heat the extrusion die.

e) It is unclear if the table of results is actually associated with Example 2. Example 2 suggests that its conditions were constant. See "The temperature of the melt and the die plate were each 200°C." (Spec. at 7) The table describes other die-plate temperatures. It cannot be discerned from the table alone whether the blowing agent was the same, and used in the same amount in each case. Thus, since the relevant conditions are not described, it cannot be determined if this constitutes evidence pointing toward nonobviousness.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. DANIELS whose telephone number is (571)272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Matthew J. Daniels/
Primary Examiner, Art Unit 1791
3/24/09